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Surveys

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INTERMOUNTAIN FOREST AND RANGE EXPERIMENT STATION
Reed W. Bailey, Director
FOREST SERVICE, U. S. DEPARTMENT OF AGRICULTURE

Ogden, Utah

March 1959

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RICKHORN

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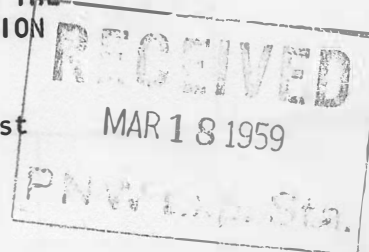
THOMAS

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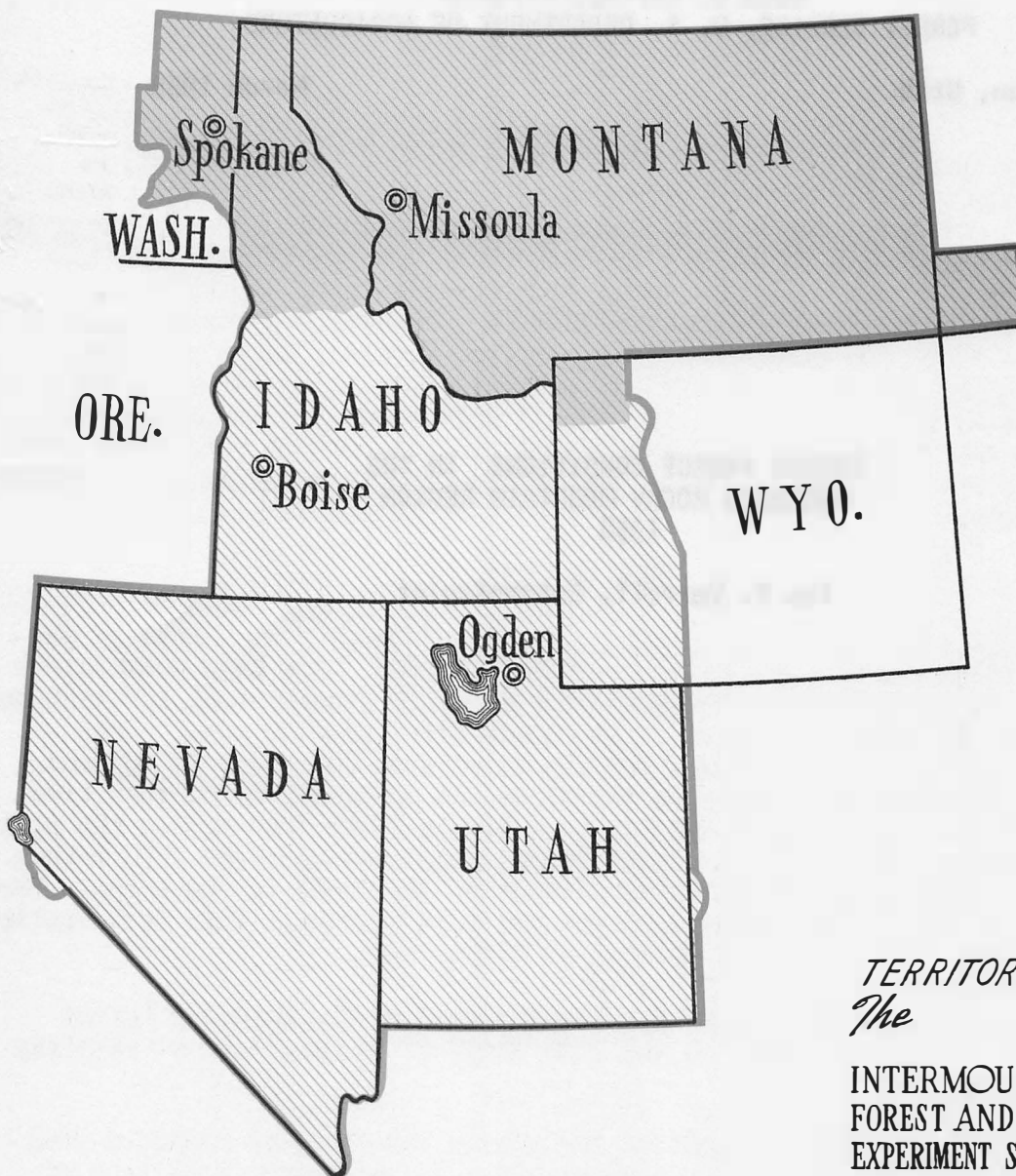
FOREST INSECT CONDITIONS IN THE
NORTHERN ROCKY MOUNTAIN REGION
1958

Tom T. Terrell, Entomologist



Prepared By The
Missoula Forest Insect Laboratory
Missoula, Montana

The AREA COVERED BY THIS REPORT



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The

INTERMOUNTAIN
FOREST AND RANGE
EXPERIMENT STATION



The MISSOULA FOREST INSECT LABORATORY is a field unit of the Intermountain Forest and Range Experiment Station at Ogden, Utah. The Laboratory conducts forest insect research, surveys forest insect outbreaks, and gives technical advice on cooperative insect control programs in Montana, northwestern South Dakota, northwestern Wyoming, northern Idaho, and northeastern Washington.

The functions are conducted in the remaining station territory by staff entomologists at Ogden, and Boise, Idaho.

FOREST INSECT CONDITIONS IN THE
NORTHERN ROCKY MOUNTAIN REGION
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Forest insect conditions in the northern Rocky Mountain region in 1958 were similar in most respects to the conditions in 1957. Bark beetle activity, especially that of mountain pine beetle, Dendroctonus monticolae Hopk., in white pine, increased during the year, and the Douglas-fir beetle, Dendroctonus pseudotsugae Hopk., appeared to be entering a new cycle of destructiveness. Defoliating insects continued to be the principal pests. Spruce budworm, Choristoneura fumiferana (Clem.), infestations were static region-wide although intensity of defoliation increased in some areas. Infestations of larch casebearer, Coleophora laricella (Hbn.), spread over large areas. Many forest insects of lesser importance were reported epidemic during the year.

BARK BEETLES

Mountain pine beetle - western white pine.--White pine stands in the Clearwater and St. Joe National Forests, Idaho, have been chronically infested by mountain pine beetle for about 25 years. Such infestations seem to be a normal condition in mature white pine stands. These infestations developed when the stands reached 120 years of age and have continued with periodic increases and decreases since that time. Currently, the infestations are at a higher level than during the past few years. Surveys by National Forest personnel recorded 1958 losses that ranged from 0.44 to 11.15 percent of the trees in the stand. The average loss in all areas surveyed was 3.96 percent. This loss applies to about 30,000 acres of white pine timber type.

A biological evaluation of the insect brood by the Missoula Forest Insect Laboratory predicts the same level of infestation, or slightly less, in 1959.

In the St. Joe Forest, surveys indicate a low level of mountain pine beetle damage in the white pine stands. Approximately 1 percent of the trees were attacked in 1958. Biological evaluation of the beetle brood indicates an upward trend: a 100 percent increase in the infestations is predicted for 1959.

Mountain pine beetle - lodgepole pine.--Two outbreaks of the mountain pine beetle have persisted for several years in lodgepole pine forests in Glacier National Park, Montana. Both of these outbreaks are in remote areas and remain confined to relatively small acreages. One of these outbreaks covers approximately 400 acres along the southern slope

of Starvation Ridge, north of Kintla Lake. An infestation in the Park Creek drainage is confined to 200 acres. A survey of the Starvation Ridge area in 1953 showed that about 900 trees were attacked during the season: a 44 percent decrease over the number attacked in 1957. Biological evaluation of the beetle brood indicates a decrease in 1959. While no detailed information is available on the numbers of trees attacked in the Park Creek area, aerial observations show the outbreak to be still active but confined to its original limits. More than half the stand has been killed during the course of the epidemic but other tree species, spruce and subalpine fir, provide a ground cover.

A few local infestations of mountain pine beetle occur in lodgepole and ponderosa pine stands in or adjacent to the Colville National Forest, Washington. These infestations are widely scattered and have only minor importance.

A local outbreak in lodgepole pine was observed near Battle Ridge Guard Station, Brackett drainage, in the Gallatin National Forest.

Western pine beetle.--Populations of western pine beetle, Dendroctonus brevicornis Lec., remain at endemic level within the region. A single outbreak affecting 20 trees was reported near Grangeville, Idaho.

Douglas-fir beetle.--Increasing activity of the Douglas-fir beetle, Dendroctonus pseudotsugae Hopk., in Douglas-fir stands, was noted throughout the region in 1958. Collaborators reported fifteen outbreaks and several more were detected during aerial surveys by Laboratory personnel. The aerial observations were incidental to other surveys and did not constitute complete aerial coverage.

An area of 4,000 acres of infested Douglas-fir timber was observed in Swan Valley adjacent to the Flathead National Forest, Montana. Private owners are now logging the timber.

Several hundred acres of infestation were observed in the Fisher River drainage in the Kootenai National Forest, Montana.

In the St. Joe River drainage, St. Joe National Forest, Idaho, an estimated 12,500 acres were observed to be infested.

Lesser outbreaks were observed in the Nezperce National Forest, Idaho. Several groups of dead and fading trees were recorded in drainages west of Riggins, Idaho.

In Yellowstone National Park, Wyoming, an outbreak of Douglas-fir beetle developed in 1957 and was again observed in 1958. Although several hundred acres of Douglas-fir timber are affected, the outbreak remains confined to the original area.

In the Gallatin National Forest, Montana, the beetle is reported epidemic in areas of heavy spruce budworm defoliation.

Engelmann spruce beetle.--Remnants of a destructive outbreak of Engelmann spruce beetle, Dendroctonus engelmanni Hopk., originating in 1952, persist in parts of the region. Present outbreaks are largely confined to logging areas where stands of pure spruce were preserved through logging-for-control of the beetle. Infestations range from less than 1 percent to 7.5 percent of the trees.

Where no logging or other control measures were used, few pure spruce stands survived the outbreak. When the pure stands were killed the infestations subsided. The outbreak in the McDonald drainage, Glacier National Park, Montana, followed such a course; very little beetle activity was recorded there in 1958.

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it continue

Most of the active outbreaks in the northwestern part of the region are confined to the Flathead and Kootenai National Forests in Montana, but part of the Kaniksu and Clearwater National Forests in Idaho are affected.

An outbreak was reported in the Beartooth Primitive Area, Custer National Forest, Montana, in 1958. The infestation appears to have developed in windfelled spruce during the past three years. This outbreak is estimated to cover 4,500 acres although the greater volume of spruce is confined to approximately 1,000 acres.

Lodgepole pine beetle.--Several attacks by the lodgepole pine beetle, Dendroctonus murrayanae Hopk., were observed in drainages of the Gallatin National Forest in 1958. These beetle-attacked trees had been injured previously by porcupine feeding, pitch moth damage, or mountain pine beetle attacks. The lodgepole pine beetle is not, ordinarily, a serious forest pest.

DEFOLIATORS

Spruce budworm.--Spruce budworm, Choristoneura fumiferana (Clem.), has infested nearly 6 million acres during the current epidemic that developed in the region in the late 1940's. During the past two years the annual increase in new infestation has been at a lower rate -- partly because nearly all the Douglas-fir host type in central Montana has been attacked. A total of 230,840 acres, mapped as new infestation during the year, resulted from extensions of older outbreaks.

Ground surveys made on 18 budworm units to measure the percentage of defoliation showed 49 and 48 percent needle defoliation for 1957 and 1958, respectively. The regionwide average, based on 689 sample plots, indicates a static condition. A summary of survey data gives the scope of the current budworm outbreak:

	<u>Acres</u>
Infested 1947-1958	5,888,000
Controlled by aerial spraying	2,090,296
Resprayed during control	115,362
Reduced to endemic level by natural control	276,000
Uncontrolled, October 1958	3,521,704

Aerial spraying with DDT insecticide has been beneficial, but the budworm has not always been completely controlled by spraying. Respraying has been necessary in some areas where reinfestation became serious. There are a few other areas, sprayed in 1953-1956, where infestations have again developed to epidemic levels. Where natural control has occurred it has reduced infestation to an endemic level.

Black-headed budworm.--Outbreaks of the black-headed budworm, Acleris variana (Fern.), that developed in 1956-1957, have subsided.

Douglas-fir tussock moth.--There are no known outbreaks of Hemerocampa pseudotsugata Mcd. in the region.

Rusty tussock moth.--An epidemic of the rusty tussock moth, Orgyia (Notolophus) antiqua (L.), developed in three areas in the Gallatin National Forest near West Yellowstone, Montana, in 1958. About 2,000 acres were heavily infested early in the season. The larvae fed mostly on undergrowth. In some instances subalpine fir was slightly damaged. Analysis of cocoons collected late in the season from the areas indicated that the infestation itself had become decadent.

Pine-feeding budworm.--Several outbreaks of the pine-feeding budworm, Choristoneura lambertianae (Busch), were observed in lodgepole pine stands in the region in 1958. These outbreaks were associated with spruce budworm infestations in adjacent or intermixed Douglas-fir stands. A small area of infestation near Missoula, Montana, was first observed in 1957; in 1958 the damage was insignificant. Several areas east of Drummond, Montana, were quite heavily defoliated in 1958.

Pine tip moth.--Pine tip moth, Rhyacionia sp., infestations were reported in 1957 in the Custer National Forest. The insects have apparently been active for several years in the Long Pine Division and have also been reported in the Sioux Division of the Forest. Severe damage has occurred in ponderosa pine reproduction, Pinus ponderosa var. scopulorum Engelm. The affected areas consist of dense patches of reproduction which have become deformed and stunted from successive years of tip damage by larvae of the moth.

Larch casebearer.--The first evidence of larch casebearer, Coleophora laricella (Hbn.), in the West was recorded in 1957 near St. Maries, Idaho. At that time a severe infestation covered an area of 15,000 acres of western larch stands. In 1958 evidence of infestation was found over a 110-square mile area in northern Idaho and northeastern Washington. The heavily damaged area is confined to the original 15,000 acres. Spread of this insect has been north and northwest to the vicinity of Sandpoint, Idaho, and Chewelah, Washington.

Larch budmoth.--An outbreak of the larch budmoth, Zeiraphera griseana (Hbn.), that developed in 1955 throughout the larch stands of the region ended in 1958. No evidence of infestation could be found by aerial or ground surveys.

Larch looper.--In conjunction with the larch budmoth outbreak, a larch looper, Semiothisa sexmaculata (Pack.), became epidemic throughout the same range of the larch type. Looper populations did not reach a high level and with a few exceptions, were confined to relatively small areas of larch type. The insect was still active in 1958 but only in small numbers.

Larch sawflies.--In 1958 an outbreak of the larch sawfly, Pristiphora erichsonii (Hartig), was found near Missoula, Montana. This is the first record of this once-common insect in the region since 1944. Several rather large patches of larch in the Blackfoot River drainage were defoliated. Counts of pupal cases in the duff indicate a large sawfly population.

SUCKING INSECTS

White pine aphid.--In 1958 a survey was made to determine if the presence of an aphid, Pineus sp., coincided with distribution of crown deterioration symptoms in western white pine stands in the region. Serious loss of 2- and 3-year old needles has occurred occasionally in these stands since 1935.

Within the last two years the condition has become serious in parts of the Clearwater, St. Joe, and Kaniksu National Forests. Mortality of young trees is evident in several areas. Considerable numbers of aphids were found in all areas affected but no association between the aphid and the crown deterioration has yet been established. These aphids have also been found throughout the white pine range, but in lesser numbers than in the areas of crown deterioration.

The pine needle scale.--Five reports of infestations of pine needle scale, Phenacaspis pinifoliae (Fitch), were received during the year. Most of these infestations were minor and were confined to ornamental evergreens around ranger stations or private residences. A single outbreak was reported in a forested area along a road.

SPIDER MITES

Spruce spider mite.--Infestations of the spruce spider mite, Oligonychus ununguis (Jacobi), were first discovered in central Montana in 1957 in Douglas-fir stands sprayed to control spruce budworm during 1956. Approximately 700,000 acres were infested. Surveys in 1958 showed that 173,000 acres were still infested, of which two-thirds were in areas sprayed during 1956 and one-third in areas sprayed in 1957. Biological evaluations showed that the mite populations were invariably higher in the sprayed areas than in unsprayed stands. Mites per current twig tip (about 2 inches long) averaged 4.48 in the sprayed areas and 0.014 in the unsprayed areas.

MISCELLANEOUS INSECTS

A bark moth in Douglas-fir.--Bark-mining larvae of a moth, Laspeyresia fletcherana Kearf., were found near Rexford, Montana, in the outer bark of Christmas tree stock. Very little is known about the activities of this insect. The damage to host trees appears to be negligible.

Pitch moth.--During aerial surveys in 1958 numerous trees with red or fading foliage were observed scattered throughout rather large areas of lodgepole pine. Affected trees usually occurred singly, but as many as 3 or 4 per acre appeared in some spots. Ground examinations showed the cause to be top killing by an undetermined species of pitch moth. The moth apparently attacks the marginal area of a bole injury where it deposits eggs. Several years of activity by successive generations of these insects eventually cause the top to die. Although affected trees were quite numerous, losses are probably not economically important.